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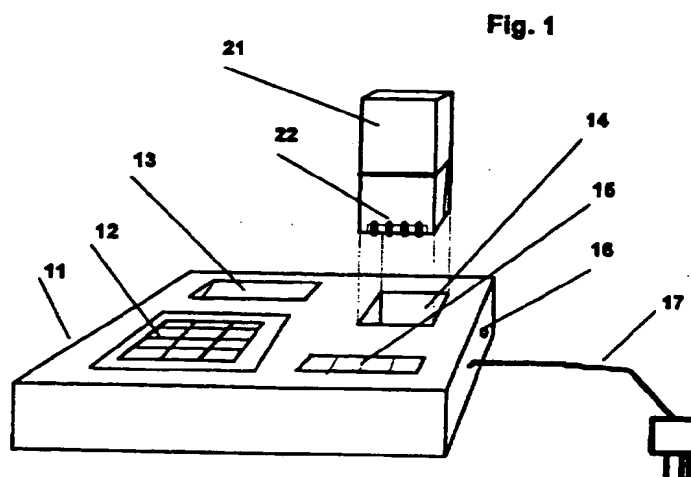
(54) A secure mobile telephone using preset number dialling

(57) The components are separated into two units, a base station 11 and a handset (mobile unit) 21, to enhance the personal security of the handset 21 carrier and give the owner financial security.

The handset 21 is inserted into the protected base station 11 for the pre-loading of selected telephone numbers. Subsequently the carrier can receive and originate calls - but only to the authorised numbers - by pressing a single button. One of the numbers would be 999 so that children, solitary women, frail and/or elderly people would have immediate protection against thieves and attackers.

The handset 21 would be capable of originating an identifiable distress signal. This could be actuated by the carrier or remotely.

Each handset 21 would be encoded so that the pre-loaded numbers could only be changed using its associated base station 11. This would make the handsets 21 of very limited value to thieves.

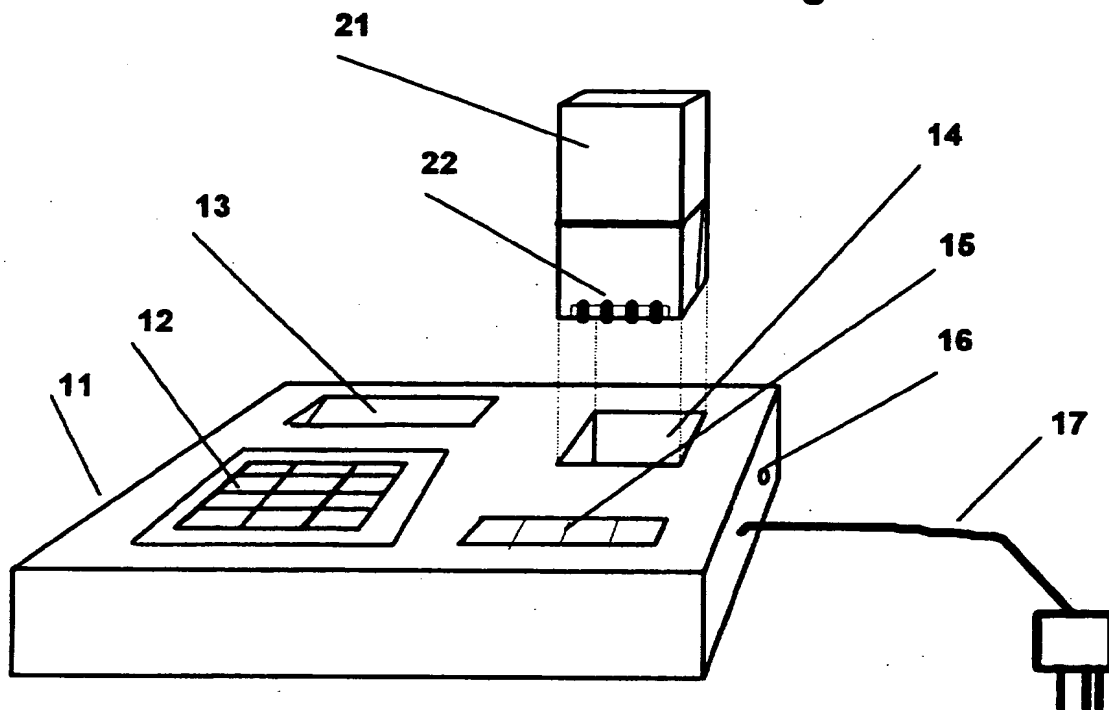


GB 2 305 577 A

A MOBILE TELEPHONE WITH SAFETY FEATURES

Page 1/2

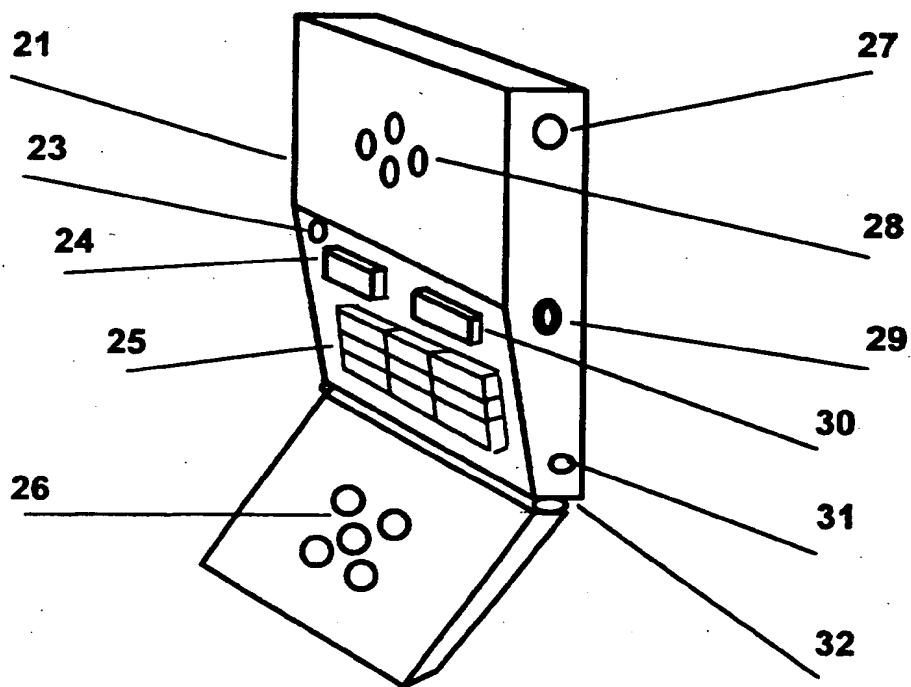
Fig. 1



A MOBILE TELEPHONE WITH SAFETY FEATURES

Page 2/2

Fig. 2



A MOBILE TELEPHONE WITH SAFETY FEATURES

This invention relates to a mobile telephone offering security features which are designed to:

- safeguard the user; and
- protect the owner's financial and operational interests (particularly when it is in the possession of another person).

Mobile telephones can originate and receive calls from almost any location in this country or the world. Calls originated on the instrument are automatically billed to the registered customer. If unauthorised access is gained to such a mobile telephone, and the owner - being unaware of the circumstances - has not taken steps to terminate the service, expensive and extended calls may be made. These are the responsibility of the customer and charges result. Thieves regularly steal mobile telephones which are then used fraudulently and excessively in the interval before the owner can suspend the service. Consequently it is sensible for an owner to keep a mobile telephone secure and not let it get into the hands of incapable, unreliable or untrustworthy people.

These security problems mean that children, invalids and other frail people - who would benefit from the availability of a normal mobile telephone - cannot be so equipped because:

- thieves or bullies would find it easy to steal and misuse the equipment
- a child or immature user might make - accidentally or by design - expensive and unnecessary calls causing financial inconvenience or hardship to the owner.

Many employers could benefit from the supply of mobile telephones to their workforces but are dissuaded by the same call-cost considerations.

According to the present invention, the component parts of the mobile telephone are built in two separate units: the base station and the mobile unit or handset. Once the base station, which is protected against unauthorised use by a security system (for example a key-and-lock or pin-number device), is powered, the handset is inserted into a slot and connected electrically to it. When tests have established that the mobile unit is legitimately and correctly associated with the base station, the memories of the handset are pre-loaded with a limited number of telephone numbers (including 999). The handset is then detached and given to the user to carry and operate. The handset user may then call any of these pre-programmed numbers by pressing a dedicated key or button. As no telephone dialling key-pad is fitted to the handset, calls to unauthorised numbers cannot be originated. Incoming calls may be permitted. No calling or receiving facilities are provided on the base station. The mobile unit must be returned to its authorised base station if it is desired to change any numbers.

The pre-loaded handset offers personal security to the person carrying it and financial security to the owner (who would be responsible for all charges):

- the handset - which is designed to be very visible - would deter a potential attacker or thief because help could be summoned very quickly by the holder
- the handset alone would have little or no market value to a potential thief
- the owner would have the assurance of knowing that only previously authorised numbers could be called and that any excessive use by the user could then be countered by re-programming the available numbers on the handset.

This secure mobile telephone would have many applications but the version for a young child is described more fully as an example.

A parent who wishes a child to have freedom to go out unsupervised would use a suitable version of the equipment to provide a high level of personal security for the child at a minimal and contained cost.

VERSION FOR A CHILD

This is described with reference to the accompanying drawings in which:-

Figure 1 shows in perspective the base station and the handset about to be inserted for pre-programming the call numbers or for battery re-charging.

Figure 2 shows the handset in the open or operational position

Referring to **Figure 1**: The base station 11 is fitted with a standard telephone 12-digit key-pad 12, a number visual display unit 13, a socket fitted with contact springs 14, and other controls 15 which in combination are used to pre-programme the handset (or mobile unit) 21, the back of which is shown to reveal the external contacts 22 which are used for power and data transfers. Also shown are the socket 16 to take the plug of the test cable which links the base station to the handset under test and training conditions, and the power cable 17.

Referring to **Figure 2**: the handset 21 is shown in the operational position with the controls displayed. When the mobile unit is needed, a start-up button 29 on the case is pressed. The microphone segment opens at the hinge 32, the ear-piece and the preset call buttons are exposed, switch 23 is released and the set is switched on. The entire unit, which would be contained within a rugged, watertight and brightly coloured plastic case, would be worn on a cord or strap (which would contain the aerial) around the neck. The aerial/strap exit point is shown at 27. The components and circuitry would include a microphone 26, ear-piece/receiver 28, transmitter/receiver, a battery (preferably re-chargeable) which is capable of at least a full-day's use, and a number of preset and labelled call buttons 25. Additionally there will be call button 24 for the Emergency Service (999). This will be of special design to be easily found in the dark or without looking. To prevent accidental alarm calls, the button to be of a double action (e.g. slide-and-press) type. Closing the microphone segment switches off the handset and terminates any call.

As well as being able to dial the preset numbers, the unit would be capable of originating an identifiable distress signal over a considerable period to help locate a lost or missing person. This could be actuated remotely as well as by means of a special interlocked button 30 on the mobile unit. The telephone transmitter would be used - possibly on a special frequency - to send a signal which would include

letters or numbers in Morse or other code to identify the mobile unit. Radio detection equipment and techniques would then be used to locate the handset by means of cross-bearings. An internal aerial would also be fitted so that the signals would continue if the external aerial was disconnected.

The socket 31 is for the insertion of the plug of the test cable. When the base station and the mobile unit are connected by means of this cable, the transmissions are inhibited and the pre-programmed numbers can be checked without originating calls. This facility will also permit the comprehensive training of the potential users.

The handset would have to be inserted into its associated base station if it is required to change any of the preset numbers. Other base station units would not work. This would be arranged by incorporating a unique identity code or encrypting signal into each set. Surface contacts would be built into the case 22 for battery re-charging purposes and for connection to the base station for loading or changing the preset numbers. The remaining components, including the battery, would be securely contained within the inner casing and special tools or know-how would be required before the handset could be opened and disabled. This would help to keep the unit operational if the user is attacked.

The base-station would have facilities for changing the preset numbers of two or more mobile units. This would minimise expenditure by parents with two or more children. Access would be restricted (for example by pin-number or the insertion of a key into a lock) to prevent unauthorised alteration of the preset numbers. There would also be facilities for inhibiting the mobile unit from receiving general calls.

Additionally if a re-chargeable battery were to be fitted, there would need to be re-charging facilities. These could be incorporated into the base station. The base station and battery charger could be incorporated into a home telephone unit so avoiding the need to duplicate components - such as the key pad and display unit.

Operationally: the parent would control the base station and preset the call buttons. The child would be able to call only the emergency service (999), home, parents at work, school and a few friends or relatives. If threatened or attacked, the child would simply press the 999 button to get immediate help. If a special series of numbers was reserved for these telephones, it would be possible to arrange for such calls to be routed directly to the Police. If other problems arise (delays through transport problems and the like) the user would be able to reassure parents, school staff or friends. If the child is lost or missing and did not respond to calls, the distress signal could be initiated remotely and used to guide rescuers.

OTHER USES AND VERSIONS

Models could also be produced for teenagers and young adults which were designed to meet their more sophisticated needs. Other versions could be designed to meet the needs of solitary women and the old and frail.

Commercial/industrial versions could also be designed to give limited communication facilities to employees who are engaged in mobile but non-managerial work. Versions could also be designed to offer protection to mountaineers, climbers, skiers, sailors and others who travel alone in risky circumstances.

CLAIMS

- 1 A mobile telephone is built in two separate units: the base station and the mobile unit. Once the base station, which is protected against unauthorised use by a security system (for example a key-and-lock or pin-number device), is powered, the handset is inserted into a slot and connected electrically to it. When tests have established that the mobile unit is legitimately and correctly associated with the base station, the memories of the handset are pre-loaded with a limited number of telephone numbers (including 999). The handset is then detached and given to the user to carry and operate. The handset user may then call any of these pre-programmed numbers by pressing a dedicated key or button. As no telephone dialling key-pad is fitted to the handset, calls to unauthorised numbers cannot be originated. Incoming calls may be permitted. No calling or receiving facilities are provided on the base station. The mobile unit must be returned to its authorised base station if it is desired to change any numbers.
- 2 The mobile unit as claimed in Claim 1 is provided with a transmitter/receiver.
- 3 The mobile unit as claimed in Claim 1 or Claim 2 is capable of using the transmitter to send out distress calls to help locate a lost or missing person. Distress calls may be initiated locally or remotely.
- 4 The mobile unit as claimed in Claim 1 is provided with an aerial which is contained within the cord or strap which is used to suspend the mobile unit around the user's neck.
- 5 The mobile unit as claimed in Claim 1 or Claim 4 is provided with a supplementary internal aerial for emergency use.
- 6 The mobile unit as claimed in Claim 1 is provided with a number of labelled call buttons each of which has been pre-programmed to initiate a call to a chosen number. The 999 button is of special design to facilitate finding it in the dark and preventing accidental use.
- 7 The mobile unit as claimed in Claim 1 or Claim 3 is provided with another interlocked button to initiate the distress transmissions.
- 8 The mobile unit as claimed in Claim 1 is provided with a battery, preferably a re-chargeable unit with an extended life.
- 9 The mobile unit as claimed in Claim 1 is provided with a microphone.
- 10 The mobile unit as claimed in Claim 1 is provided with an audio receiver or ear-piece.
- 11 All components of the mobile unit as claimed in Claim 1, other than the start-up button, the call-buttons, microphone and ear-piece, are enclosed in a secure casing which requires either special tools or know-how to open.

12 The base station as claimed in Claim 1 would be capable of programming or re-programming two or more mobile stations providing they were specifically associated with it.

13 The base station as claimed in Claim 1 or Claim 12 is provided with a keypad, display unit and controls to select, check and load numbers into the associated mobile unit.

14 The base station and the mobile station as claimed in Claim 1 are fitted with sockets so they may be linked by a cable for test and training purposes.

15 A mobile telephone system built in two separate units substantially as described herein with reference to Figures 1 - 2 of the accompanying drawings.

Amendments to the claims have been filed as follows

1 A mobile telephone comprising facilities to initiate and receive the normal scope of telephone calls has the components placed in two separate units - the base station and the mobile unit - so that the mobile unit may only be used in ways previously determined by the base station controller.

2 The base station as claimed in Claim 1, which is protected against unauthorised use by a security system (for example a key-and-lock or pin-number device), is not fitted with a microphone or ear-piece or other components needed to originate or receive calls, but comprises a call dialler, a visual display to show numbers dialled, a socket with electrical contacts for arranging communications with the mobile unit, and testing facilities.

3 The mobile unit (or handset) as claimed in Claim 1 is not fitted with dialling facilities but comprises a transmitter/receiver, a microphone, an ear-piece and a number of keys each of which, when actuated, refers to a pre-programmed memory and initiates an authorised telephone call.

4 The base station and mobile unit as claimed in Claim 1 are connected together initially for establishing that the mobile unit is legitimately and correctly associated with the base station and then for preloading the memories of the mobile unit with a limited number of telephone numbers (including 999).

5 The mobile unit as claimed in Claims 1,2 and 3 is then detached and given to the user to carry and operate: to call any of these pre-programmed numbers by pressing a labelled and dedicated key or button, or to receive incoming calls.

6 The mobile unit as claimed in any of the above claims, must be returned to its authorised base station if it is desired to change any numbers.

7 The mobile unit as claimed in any of the above claims, is capable of using the transmitter to send out distress calls to help locate a lost or missing person, and these distress calls may be initiated locally or remotely.

8 The mobile unit as claimed in any of the above claims is provided with an aerial which is contained within the cord or strap which is used to suspend the mobile unit around the user's neck.

9 The mobile unit as claimed in any of the above claims is provided with a supplementary internal aerial for emergency use.

10 As well as the labelled call buttons, the mobile unit as claimed in any of the above claims, is provided with an emergency or 999 button which is of special design to facilitate finding it in the dark and preventing accidental use.

11 The mobile unit as claimed in any of the above claims is provided with another button of a special design which is actuated to initiate (but not subsequently stop) the distress transmissions.

12 The mobile unit as claimed in any of the above claims, is provided with a start-up button which, when pressed, causes the casing to open, this act

automatically switches on the unit and gives access to the microphone, ear-piece and call buttons.

13 The mobile unit as claimed in any of the above claims is provided with a battery, preferably a re-chargeable unit with an extended life.

14 All components of the mobile unit as claimed in any of the above claims, other than the start-up button, the call-buttons, microphone and ear-piece, are enclosed in a secure casing which requires either special tools or know-how to open.

15 The base station as claimed in Claim 1 and any of the above claims, would be capable of programming or re-programming two or more mobile units providing they were specifically associated with it.

16 Although the base station and the mobile unit as claimed in any of the above claims are designed to fit together for programming/reprogramming purposes, they are both fitted with special sockets so they may be linked by a cable for test and training purposes.

17 A mobile telephone system built in two separate units substantially as described herein with reference to Figures 1 - 2 of the accompanying drawings.



Application No: GB 9519410.6
Claims searched: 1-15

Examiner: David Midgley
Date of search: 27 February 1996

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK CI (Ed.O): H4L (LDSK,LECC,LECX)
Int CI (Ed.6): H04Q 7/22, 7/32
Other: ONLINE: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB 2258584 A (RANSOME) see whole doc	1

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.